

a conductive film forming chamber disposed along the second substrate transferring portion forming a conductive film on the substrate formed with an insulating film having a recessed portion in a front face thereof so that the recessed portion is embedded with the conductive film;

wherein the substrate formed with the conductive film in the conductive film forming chamber is polished in the polishing chamber so that the conductive film formed on the front face of the insulating film except for the recessed portion is polished away.

* * *

REMARKS

This is in full and timely response to the Office Action mailed June 10, 2002. Reexamination and reconsideration in light of the above amendments and the following remarks is respectfully requested.

By the foregoing amendment, claim 1 was amended to incorporate the features of claims 2 and 3, as well as reciting that the drying chamber has a first transferring port and a second transferring port for drying the cleaned substrate transferred from the cleaning chamber through the first transferring port, and a transferring mechanism for receiving the dried substrate from the drying chamber through the second transferring port. Support for this amendment can be found variously throughout the specification, for example, Fig. 1 and page 7, line 22 to page 15, line 26. Claim 5 was amended to depend from claim 1. Claim 9 was amended to recite the step of polishing a conductive film which is formed on the substrate, that step of cleaning and drying the polished substrate, and that the substrate is transferred to a position for forming a thin film by a CVD method under reduced pressure and forming the thin film at that position. Support for this amendment can be found variously throughout the specification, for example, at page 14, line 7 to page 17, line 3. Claim 10 was amended to further recite the step of forming the conductive film on the substrate. Support for this amendment can be found variously throughout the specification, for example, at page 10, line 11 to page 11, line 6. Claims 12-18 were amended for clarity, for example, referring to a first substrate processing portion for vacuum type

processing and a second substrate processing portion for solution-type processing. Support for these amendments can be found variously throughout the specification, for example, at page 6, line 5 to page 23, line 25. No prohibited new matter was added. Claims 2-4, 11 and 19-22 were canceled without prejudice or disclaimer. Claims 1, 5-10 and 12-18 are currently pending for the Examiner's reconsideration, with claims 1, 9 and 12 being independent.

Rejections under 35 U.S.C. §103

Claims 1-6, 8-11, 13-16 and 20-22 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,110,011 to Somekh et al. in view of Japanese Patent Publication 07-183299, U.S. Patent No. 6,153,524 to Henley et al. and U.S. Patent No. 5,672,239 to DeOrnellas. Applicants respectfully traverse this rejection. By this Amendment, Applicants have cancelled claims 2-4, 11 and 19-22, mooted these portions of the rejection.

Applicants wish to point out that claims 13-16 depend from claim 12, for which no statement of rejection under these references has been made. Accordingly, claims 13-16 are allowable as depending from an allowable base claim.

Still further, Applicants wish to point out that claim 8 depends from claim 7, for which no statement of rejection under these references has been made. Accordingly, claim 8 is allowable as depending from an allowable dependent claim.

Claim 1 recites an apparatus, comprising: a polishing chamber for polishing a conductive film which is formed on a substrate; a cleaning chamber for cleaning the polished substrate polished in the polishing chamber; a drying chamber, having a first transferring port and a second transferring port, for drying the cleaned substrate transferred from the cleaning chamber through the first transferring port under a reduced pressure; a film forming chamber for forming a thin film on the substrate by a CVD method under the reduced pressure; and a transferring mechanism for receiving the dried substrate from the drying chamber through the second transferring port and for transferring the received substrate to the film forming chamber under the reduced pressure

Claim 9 recites a method, comprising the steps of: polishing a conductive film which is formed on the substrate; cleaning and drying the polished substrate under a reduced pressure; and transferring the substrate to a position for forming a thin film by a CVD method performed under

the reduced pressure and forming the thin film at the position while maintaining the reduced-pressure state.

The present invention recited in claim 1 and claim 9, a conductive film formed on a substrate is polished and the substrate is dried under reduced pressure after it is cleaned. The substrate is transferred to a position for forming a thin film by a CVD method and the thin film is formed at the position while maintaining the reduced-pressure state. Additionally, in claims 1 and 9, the substrate is transferred to a position for forming the thin film by the CVD method while maintaining the reduced-pressure state, which results in obtaining an original effect of being able to save energy used for reducing pressure of the area for forming the thin film by the CVD method, which neither Henley nor Somekh et. al. has.

On the contrary, as acknowledged in the Office Action, Somekh et al. '011 neither discloses or suggests any means for forming a thin film by the CVD method. Henley et al. '524 does disclose a CVD chamber. However, neither Somekh et.al. '011 nor Henley et al. '524 disclose transferring the substrate to a position for forming a thin film by the CVD method and forming the thin film thereon at the position while maintaining the reduced-pressure state. The Examiner opines that "It would have been obvious to one of ordinary skill in the art...to provide the apparatus of Somekh with a CVD chamber and etching chamber as taught by Henley. This would allow a substrate to have a film deposited or etched." Office Action at page 3, lines 10-12. Applicants disagree. The Examiner has not established a prima facie case of obviousness. Additionally, the examiner has not shown any motivation for this combination. Merely stating "This would allow a substrate to have a film deposited or etched" is a conclusion, not a statement of motivation to combine. Such a conclusion could not be reached without piecemeal assembly of the claimed elements resulting from improper hindsight.

Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination. Under section 103, teachings of references can be combined only if there is some suggestion or incentive to do so. The prior art of record fails to provide any such suggestion or incentive, particularly there is no need in Somekh et.al. '011 to add the CVD apparatus of Henley et al. '524. ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984).

For motivation to combine, the examiner alleges that "[T]his would allow a substrate to have a film deposited or etched." Applicants believe that this is simply an assembly of elements by the examiner, and therefore a situation of the Examiner using improper hindsight. It is established law that one "cannot use hindsight reconstruction to pick and chose among isolated disclosures in the prior art to deprecate the claimed invention." Ecolochem, Inc. v. Southern California Edison Company, page 23, September 7, 2000 (Fed. Cir.) (citing In re Fine, 837 F.2d 1071, 1075, 5, USPQ2d 1780, 1783 (Fed. Cir. 1988)). "Combining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure as a blueprint for piecing together the prior art to defeat patentability—the essence of hindsight." Ecolochem at 24 (citing In re Dembiczak, 175 F.3d 994, 999, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999)). "When a rejection depends on a combination of prior art references, there must be some teaching, suggestion or motivation to combine the references." Ecolochem at 24 (citing In re Rouffet, 149 F.3d 1350, 1355, 47 USPQ2d 1453, 1456 (Fed. Cir. 1988), citing In re Geiger, 815 F.2d 686, 688, 2 USPQ2d 1276, 1278 (Fed. Cir. 1987)). Additionally, "defining the problem in terms of its solution reveals improper hindsight in the selection of the prior art relevant to obviousness." Ecolochem at 24 (citing Monarch Knitting Mach. Corp. v. Sulzer Morat GmbH, 139 F.3d 877, 880, 45 USPQ2d 1977, 1981 (Fed. Cir. 1998)).

Hashimoto '299 and DeOrnellas '239 do not make up for the deficiencies of Somekh et.al. '011 nor Henley et al. '524, either separately or in combination.

Because the examiner has not established a prima facie case of obviousness based on properly combined references, withdrawal of the §103 rejection of claims 1 and 9 is respectfully requested.

Dependent claims 5-6, being dependent upon allowable claim 1, and claims 10, being dependent upon claim 9, are also allowable for the reasons above. Moreover, these claims are further distinguished by the additional features recited therein, particularly within the claim combination.

Accordingly, withdrawal of the §103 rejections is respectfully requested

Claim 7 is rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,110,011 to Somekh et al. in view of Japanese Patent Publication 07-183299, U.S. Patent No. 6,153,524 to Henley et al. and U.S. Patent No. 5,672,239 to DeOrnellas, and further in view of U.S. Patent 6,146,135 to Watanabe et al. Applicants respectfully traverse this rejection.

Dependent claim 7, being dependent upon allowable claim 1, is allowable for the reasons above. Moreover, this claim is further distinguished by the additional features recited therein, particularly within the claim combination.

Accordingly, withdrawal of the §103 rejections is respectfully requested.

Claims 12 and 17-19 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 6,110,011 to Somekh et al. in view of Japanese Patent Publication 07-183299, U.S. Patent No. 6,153,524 to Henley et al. and U.S. Patent No. 5,672,239 to DeOrnellas, and further in view of U.S. Patent 5,855,726 to Soraoka et al. Applicants respectfully traverse this rejection. By this Amendment, Applicants have cancelled claim 19, mooted this portion of the rejection.

Applicants wish to point out that no statement of rejection under these references has been made for claims 17-18, which depend from claim 12. Accordingly, claims 17-18 are allowable as depending from an allowable base claim.

Claim 12 recites an apparatus, comprising: a first substrate carrier for transferring a substrate in an atmospheric air; a first substrate processing portion performing a vacuum type processing on the substrate; a second substrate processing portion performing a solution type processing on the substrate; a first delivering and receiving portion delivering and receiving the substrate having a relation to the solution type processing between the second substrate processing portion and the first substrate processing portion; and a second delivering and receiving portion delivering and receiving the substrate having no relation to the solution type processing between the first substrate transferring portion and the first substrate processing portion.

Soraoka et al. '726 disclose two load lock chambers, however, they do not disclose or suggest "a first delivering and receiving portion delivering and receiving the substrate having a relation to the solution type processing between the second substrate processing portion and the

first substrate processing portion” and “a second delivering and receiving portion delivering and receiving the substrate having no relation to the solution type processing between the first substrate transferring portion and the first substrate processing portion” as recited in claim 12.

The Office Action acknowledges that Soraoka et al. '726 discloses and teaches only one atmospheric substrate carrier. See Office Action at page 5, lines 5-6. The Examiner then opines that having more than one carrier is a “mere duplication of parts.” However, the Examiner fails to establish a prima facie case of obviousness, as duplication of parts is only relevant when the duplication is between the same units as the reference. That is, the load lock chambers are not the same as recited in claim 12, above, and accordingly, are not taught or suggested by Soraoka et al. '726. Still further, Soraoka et al. '726 does not make up for the deficiencies of the primary references Somekh et.al. '011, Henley et al. '524, Hashimoto '299 and DeOrnellas '239, either separately or in combination.

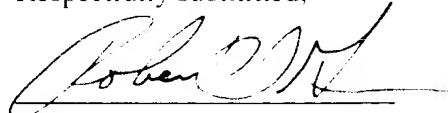
Dependent claims 17-18, being dependent upon allowable claim 12, are allowable for the reasons above. Moreover, these claims are further distinguished by the additional features recited therein, particularly within the claim combination.

Accordingly, withdrawal of the §103 rejections is respectfully requested.

Conclusion

For the foregoing reasons, claims 1 and 4-16 are in condition for allowance. Accordingly, favorable reexamination and reconsideration of the application in light of these amendments and remarks is courteously solicited. If the examiner has any comments or suggestions that would place this application in even better form, the Examiner is requested to telephone the undersigned attorney at the number below.

Respectfully submitted,



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Should additional fees be necessary in connection with the filing of this paper, or if a petition for extension of time is required for timely acceptance of same, the Commissioner is hereby authorized to charge Deposit Account No. 180013 for any such fees; and applicant(s) hereby petition for any needed extension of time.

Appendix I

In accordance with 37 CFR 1.121 (c)(1)(ii), amended claims 1, 5, 9-10 and 12-18 are set forth in a marked-up version below:

1. (amended) An [film forming] apparatus, comprising:
a polishing chamber for polishing a conductive film which is formed on a substrate;
a cleaning chamber for cleaning the polished substrate polished in the polishing chamber;
a drying chamber, having a first transferring port and a second transferring port, for drying [a] the cleaned substrate transferred from the cleaning chamber through the first transferring port under a reduced pressure;
a film forming chamber for forming a thin film on the substrate by a CVD method under [a] the reduced pressure; and
a [transfer path] transferring mechanism for receiving the dried substrate [for transferring the substrate under a reduced pressure] from the drying chamber through the second transferring port and for transferring the received substrate to the film forming chamber under the reduced pressure.

5. (amended) The apparatus as set forth in claim [3] 1, further comprising:
a conductive film forming chamber for forming a conductive film on the substrate formed with an insulating film having a recessed portion in a front face thereof [to embed it in] so that the recessed portion is embedded with the conductive film;[,]

wherein the substrate formed with the conductive film in the conductive film forming chamber is polished in the polishing chamber so that the conductive film formed on the front face of the insulating film except for the recessed portion is polished away.

9 (amended) A [film forming] method, comprising the steps of:
polishing a conductive film which is formed on the substrate;
cleaning and drying [a cleaned] the polished substrate under a reduced pressure; and

transferring the substrate to a position for forming a thin film by a CVD method performed under reduced pressure and forming the thin film at the position while maintaining [with] the reduced-pressure state. [kept after the reduced-pressure drying; and forming a film on the substrate by a CVD method under a reduced pressure after the transfer.]

10. (amended) The method as set forth in claim 9, further comprising the steps of: forming the conductive film on the substrate on which an insulating film having a recessed portion on a front face thereof is formed before the polishing step so that the recessed portion is embedded with the conductive film.

[wherein an oxidization-prone film is formed on the substrate.]

12. (amended) An apparatus, comprising:
a first substrate carrier for transferring a substrate in an atmospheric air;
a first substrate processing portion performing a vacuum type processing on the substrate;
a second substrate processing portion performing a solution type processing on the substrate;
a first delivering and receiving portion delivering and receiving the substrate having a relation to the solution type processing between the second substrate processing portion and the first substrate processing portion; and
a second delivering and receiving portion delivering and receiving the substrate having no relation to the solution type processing between the first substrate transferring portion and the first substrate processing portion.

[a second substrate carrier provided almost perpendicular to the first substrate carrier for transferring the substrate in the atmospheric air; and

a processing chamber capable of delivering and receiving the substrate to/from at least one of the first substrate carrier and the second substrate carrier, for processing the substrate under a reduced pressure.]

13. (amended) The apparatus as set forth in claim 12.

wherein the first substrate processing portion [chamber is] has a CVD film forming chamber.

14. (amended) The apparatus as set forth in claim 12,
wherein the first substrate processing portion [chamber is] has an etching processing chamber.

15. (amended) The apparatus as set forth in claim 12,
wherein the first substrate processing portion [chamber is] has a resist removing chamber.

16. (amended) The apparatus as set forth in claim 12, [further comprising:]
[a cleaning chamber for cleaning the substrate,]
wherein the substrate delivering and receiving portion has a mechanism of drying the substrate [cleaned in the cleaning chamber is dried] under a reduced pressure [in the processing chamber].

17. (amended) The apparatus as set forth in claim 12, further comprising:
a second substrate carrier perpendicularly connected to the first substrate carrier and also
connected to the first substrate delivering and receiving portion for transferring the substrate in
an atmospheric air;

[wherein the processing chamber is capable of delivering and receiving the substrate to/from the first substrate carrier, and

wherein the apparatus further comprises:]

a polishing chamber, disposed along the second substrate carrier [capable of delivering and receiving the substrate to/from the first substrate carrier], for polishing the substrate;

a cleaning chamber, disposed along the second substrate carrier [capable of delivering and receiving the substrate to/from the first substrate carrier], for cleaning the polished substrate [processed in the polishing chamber; and

a drying chamber, capable of delivering and receiving the substrate to/from the first substrate carrier, for drying under a reduced pressure the substrate cleaned in the cleaning chamber.]

18. (amended) The apparatus as set forth in claim 17, further comprising:

a conductive film forming chamber, disposed along the second substrate carrier [capable of delivering and receiving the substrate to/from the first substrate carrier], for forming a conductive film on the substrate formed with an insulating film having a recessed portion in a front face thereof so that the recessed portion is embedded with the conductive film [to embed it in the recessed portion],

wherein the substrate formed with the conductive film in the conductive film forming chamber is polished in the polishing chamber so that the conductive film formed on the front face of the insulating film except for the recessed portion is polished away.